
# PHENIX
# NORTH MUON MAGNET COIL
# INSTALLATION PROCEDURE

**procedure name**

## PHENIX Procedure No. 2.5.5.4-31

**Revision: A** **Date: 3/22/2007**

### Hand Processed Changes

| HPC No. | Date | Page Nos. | Initials |
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### Approvals

**Don Lynch**
PHENIX S E & I Date

Cognizant Scientist/Engineer /Activity Manager Date

PHENIX QA/Safety Date

RHIC ES&H Date

**REVISION CONTROL SHEET**

| LETTER | DESCRIPTION | DATE | WRITTEN BY | APPROVED BY | CURRENT OVERSIGHT |
|---|---|---|---|---|---|
| A | First Issue (Note: issued as procedure for control purposes. Originally prepared as attachments to work permit for Installation. | 3/22/2007 | D. Lynch | (See appropriate work permits) | D. Lynch |
| Deactivated | Original installation complete. Re-activate to re-issue or revise installation procedure when necessary | 3/22/2007 | D. Lynch | D. Lynch, R. Pisani, P. Giannotti | D. Lynch |
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# North Muon Magnet Coil Installation

**(Reference: LLNL Dwg. No. AAA 93-104155-0A)**

## ***Wedge Sizing***

1. Use (2) 20-foot slings, attached to the 10-ton hook, to lift the inner coil from the piston and slide it south approximately 12" (do not go beyond the point where the piston diameter changes). Rotate the coil 22.5 degrees (in the clockwise direction when viewed looking north). Return coil to rest on the piston and remove slings.

2. Use the same slings to lift the Outer coil from the piston and slide it south approximately 12". Rotate the coil 22.5 degrees (in the clockwise direction when viewed looking north).

3. With the Outer coil still suspended by slings, insert approximately 10 NEMA G10 Phenolic wedges symmetrically around the coil I.D., at the end nearest the muon magnet backplate. Tap the wedges in lightly and evenly all-around until snug between the coil and the piston. Mark the portion protruding beyond the coil for trimming. Remove the wedges.

4. Compute the average length to be trimmed. It should be .875".

5. Repeat Steps (3) & (4) for the other end of the Outer coil. Again, the trimmed length should average .875".

6. Send (40) wedges to the shop and have them trimmed to this dimension.

7. Rest the Outer coil back onto the piston. Transfer the slings to the Inner coil and lift it from the piston.

8. Repeat Steps (3) & (4) for the two ends of the Inner coil. The length to be trimmed from these wedges should average .625" (.25" less than for the outer coil). ***DO NOT TRIM THESE WEDGES UNTIL AFTER THE OUTER COIL WEDGES HAVE BEEN SUCCESSFULLY INSTALLED (STEP # 13).***

## ***Outer Coil Installation***

9. Install the Outer coil rear spacer (Part No. 93-104211).

10. Mark (20) symmetric locations around the circumference of the piston, just south of the rear spacer.

11. Epoxy (20) of the trimmed wedges to the piston at the marked locations, butted against the spacer, using Epon Resin #828 and Epicure #3140 Curing Agent. Allow 24-hours to cure.

12. Lift the Outer coil and slide it north, toward the wedges. Check that the 22.5 degree rotated position of the bus-flag is maintained. Slowly slide the coil onto the wedges until it begins to contact them. Check that the coil/wedge positioning is uniform around the circumference and continue sliding the coil until it can go no further. The ends of the wedges should be uniformly flush with the end of the coil, which should be butted against the spacer. Measure and note any clearances or protrusions. ***KEEP WEIGHT OF COIL ON SLINGS.***

13. Place epoxy on (20) Outer coil south-end wedges, and slide them into symmetric positions corresponding to the circumferential locations of the north-end wedges. Tap in until snug, bringing the face of the wedges even with the edge of the coil. ***If the method of trimming wedges for the Outer coil is judged to have been successful, send the (40) wedges for the Inner coil (measured in Step #8) to the shop for trimming at this time.***

14. Verify that the north-end wedge/spacer plate positioning has not been altered by the installation of the south-end wedges. Verify that the bus-flag position is still correct.

15. Install the south-end retaining ring (Part No. 93-104210). ***LEAVE WEIGHT OF COIL ON SLINGS AND ALLOW EPOXY TO CURE FOR 24-HOURS (LOCK-OUT CRANE OPERATIONS).***

16.. Slowly release the weight of the coil onto the wedges. Verify that the final positioning is acceptable.

## ***Inner Coil Installation***

17. Mark (20) symmetric locations around the circumference of the inner portion of the piston, just south of the inner coil diametrical step.

18. Epoxy (20) of the trimmed Inner coil wedges to the piston at the marked locations, butted against the piston-step, using Epon Resin #828 and Epicure #3140 Curing Agent. Allow 24-hours to cure.

19. Prepare the coil jumper (Part No. 93-104155) to be installed loosely between the inner and outer coils in order to check for proper rotational alignment between the bus-flags.

20. Lift the Inner coil and slide it north, toward the wedges. Check that the 22.5 degree rotated position of the bus-flag is maintained. Slowly slide the coil onto the wedges until it begins to contact them. Check that the coil/wedge positioning is uniform around the circumference, and continue sliding the coil until it can go no further. The ends of the wedges should be uniformly flush with the end of the coil, which should be butted against the piston-step. Measure and note any clearances or protrusions. ***KEEP WEIGHT OF COIL ON SLINGS.***

21. Place epoxy on (20) Inner coil south-end wedges, and slide them into symmetric positions corresponding to the circumferential locations of the north-end wedges. Tap in until snug, bringing the face of the wedges even with the edge of the coil.

22. Verify that the north-end wedge/coil positioning has not been altered by the installation of the south-end wedges. Verify that the bus-flag position is still correct and that the jumper fits properly.

23. Install the south-end retaining ring (Part No. 93-104209). ***LEAVE WEIGHT OF COIL ON SLINGS AND ALLOW EPOXY TO CURE FOR 24-HOURS (LOCK-OUT CRANE OPERATIONS).***

24. Slowly release the weight of the coil onto the wedges. Verify that the final positioning is acceptable.

25. Install the coil jumper in its final position.